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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,322	05/01/2001	Nobufumi Mori	Q64266	2257

7590 12/23/2003
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EXAMINER

PHAM, HAI CHI

ART UNIT PAPER NUMBER

2861

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/845,322

Applicant(s)

MORI ET AL.

Examiner

Hai C Pham

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MU

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim **18** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 18 sets forth the following limitation "the casing section, the optical recording section, the thermal developing section and the optical fixing section are arranged in a vertical configuration (emphasis added)", which is not described in the specification at the time the application was filed. Moreover, such configuration is not shown in the drawings where only a horizontal configuration is shown.

Due to the lack of support by the disclosure, the limitation is deemed to be unclear so as to whether the inventors had possession of the claimed element, and is therefore precluded from consideration in view of the prior art.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

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unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-5, 7-9, 12-13 and 21 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5, 10-12 of U.S. Patent No. 6,499,893 B2 in view of Umehara et al. (JP 57-5044) and Mouri et al. (U.S. 5,073,791).

Claims 1-5, 11-12 of U.S. Patent No. 6,499,893 B2 recite all the claimed limitations of the current invention including:

- an optical recording section, which exposes the light and heat sensitive recording material for recording a latent image,
- a thermal developing section, located downstream of the optical recording section, which develops the latent image by heating,
- an optical fixing section, positioned downstream of the thermal developing section, which irradiates light onto the light and heat sensitive recording material for fixing the developed image,

- the optical recording section has a light source, and the light source is a laser light source, which has an intensity maximum in a wavelength range from 300 to 1,100 nm (visible light range),
- a maximum irradiation light amount at the optical recording section being from 0.01 to 50 mJ/cm²,
- the heating temperature at the thermal developing section being from 50 to 200°C,
- the optical fixing section fixing with light having intensity so as to provide an illumination of 20,000 to 6,000,000 lux,
- the light and heat sensitive recording layer which contains thermally-responsive microcapsules, which encapsulate a substantially colorless compound that reacts with a color-forming component to form color and, outside the microcapsules, a photo-polymerizable composition, which includes at least the color-forming component, a photo-polymerizable compound and a photo-polymerization initiator.

However, with regard to claims 1 and 12, U.S. Patent No. 6,499,893 B2 fails to recite the fixation light being a visible light and the casing section encasing the light and heat sensitive recording material.

Umehara et al. discloses an image forming apparatus comprising an exposure section (located at the conveying belt 2a) for imagewise exposing a light and heat sensitive recording material with visible light, a developing section (located at the conveying belt 2b) positioned downstream of the exposure section for developing the

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recording material by heating (heating plate 4), and a fixing section (located at the conveying belt 2c, and including a light source 5 emitting a visible light and a heating plate 4) positioned downstream of the developing section for irradiating the recording material with visible light (simultaneously fixing with visible light (5) and heating (4)).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use visible light for fixation of the light and heat sensitive recording material as taught by Umehara et al. The motivation for doing so would have been to provide a simple and inexpensive fixing device consisting of just a regular light source for emitting a visible light.

On the other hand, it is well known in the art that any printer would be provided with a casing or housing of any type for storing the recording media as evidenced by Mouri et al. which discloses an image forming apparatus including a photosensitive cartridge (13) for housing the light and heat sensitive recording material (photo-sensitive and heat-developing material 11) to be supplied to the imaging exposure portion (2) where the photo-sensitive and heat-developing material is imagewise exposed by the laser exposure means (10), a heating developing portion (3) where the photo-sensitive and heat-developing material is subjected to heating development at 120° C, and the fixing unit (whole-surface exposure portion 4) where the photo-sensitive and heat-developing material is subjected to fixing by exposure from a light source (22). Mouri et al. further teaches the provision of a cutter (16) for cutting the photo-sensitive and heat-developing material into a sheet for processing, and the photosensitive cartridge, the

imaging exposure portion, the heating developing portion and the fixing portion being arranged in a vertical configuration (Fig. 1).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to include the recording medium housing as taught by Mouri et al. The motivation for doing so would have been to provide an enclosure for the recording medium, which would shield the recording medium from light since the recording medium is a light sensitive material by definition.

5. Claims 1, 6, 12-13, 14-16 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent No. 6,499,893 B2 in view of Umehara et al., Mouri et al. and Yamada et al. (U.S. 5,264,316).

Claims 1-2 of U.S. Patent No. 6,499,893 B2 in view of Umehara et al. and Mouri et al. recites all the claimed limitations of the current invention except for the range of variation of the heating temperature of the thermal developing section being set at most 5° C, and the various types of light source and plural light sources of the exposure section.

It is known in the printing art that the temperature distribution in a heat-developing device should be kept less than $\pm 1^{\circ}\text{C}$ as a requirement. Yamada et al., for example, discloses a heat-developable image recording material whose temperature distribution variation would be kept within a strict requirement of $\pm 1^{\circ}\text{C}$ during the heat development of the color latent image (see Table 1). Yamada et al. further teaches that

various kinds of light sources can be used in the imagewise exposure, which can be selected from solid state laser, gas lasers, chemical lasers, and that additional light sources of different wavelengths can be used in the case where the full color image is formed (col. 19, lines 14-46).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to set a strict temperature distribution variation limitation as well as to select proper recording light source(s) as taught by Yamada et al. The motivation for doing so would have been to select proper light source(s) with consideration of the light-sensitive wavelength and to apply a uniform distribution of heating energy over the entire surface of the recording medium for development to promote a sharp and stable color image as suggested by Yamada et al.

6. Claims 1 and 10-11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,499,893 B2 in view of Umehara et al., Mouri et al. and Kubo et al. (U.S. 6,303,259 B1).

Claim 1 of U.S. Patent No. 6,499,893 B2 in view of Umehara et al. and Mouri et al. recites all the claimed limitations of the current invention except for the composition of the light and heat sensitive recording layer.

However, Kubo et al. discloses a method of recording an image on a heat and light-sensitive recording material, which includes providing visible light of three waves having different wavelengths for imagewise exposing the heat and light-sensitive

recording material to form a latent image, heat developing the latent image, and an UV light to fix the developed image (col. 3, lines 36-59), the recording process being performed in the above specified sequences. Kubo et al. further teaches the recording light having an intensity maximum at wavelength selected from a wavelength range of 300 and 1100 nm (RGB light), the thermal developing temperature being of 50 to 200°C (col. 3, lines 60-64). Kubo et al. also discloses the heat and light-sensitive recording material having layer comprising color-forming component or dye-precursor being either enclosed in the core of the microcapsules or disposed in the shell of the microcapsules and a photo-polymerization composition or developer being again disposed outside of the microcapsules or enclosed in the microcapsules such that they are capable of reacting to each other to form color, the photo-polymerization composition further containing a photo-polymerization initiator (5) and a polymerizing substance (6). With regard to claims 10, 11, Kubo et al. teaches the heat and light-sensitive recording material being provided with a photo-curable heat and light-sensitive recording layer having a dye-forming coupler such as phenolic compounds capable of coupling with the oxidant (diazonium salts) to form a dye, such that light irradiation cures an irradiated portion of the heat and light-sensitive recording layer.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the light and heat sensitive recording layer as taught by Kubo et al. for the purpose of accelerating the development reaction of the recording material compounds under the exposure of a proper light.

7. Claims 1, 17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,499,893 B2 in view of Umehara et al., Mouri et al. and Kagayama et al. (U.S. 5,038,710).

Claim 1 of U.S. Patent No. 6,499,893 B2 in view of Umehara et al. and Mouri et al. recites all the claimed limitations of the current invention except for the cutter.

Kagayama et al. discloses an image forming apparatus in which the support member (8) is cut into a sheet of predetermined length after the heat fixing process (col. 4, lines 52-56).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a cutter as taught by Kagayama et al. The motivation for doing so would have been to provide the final reproduced image on a sheet of medium of a desired size since the original recording medium is being provided in the form of a roll of recording material and that the provision of the cutter is necessary.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-2, 4, 12, 13, 17, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mouri et al. in view of Umehara et al.

Mouri et al. discloses an image forming apparatus including a photosensitive cartridge (13) for housing the light and heat sensitive recording material (photo-sensitive and heat-developing material 11) to be supplied to the imaging exposure portion (2) located further downstream where the photo-sensitive and heat-developing material is imagewise exposed by the laser exposure means (10), a further downstream heating developing portion (3) where the photo-sensitive and heat-developing material is subjected to heating development at 120° C, and the fixing unit (whole-surface exposure portion 4) where the photo-sensitive and heat-developing material is subjected to fixing by exposure from a light source (22).

Mouri et al. does not explicitly specify the wavelength of such light source, meaning that a light source of any appropriate wavelength could be used for the fixing unit.

Umehara et al. discloses an image forming apparatus comprising an exposure section (located at the conveying belt 2a) for imagewise exposing a light and heat sensitive recording material with visible light, a developing section (located at the conveying belt 2b) positioned downstream of the exposure section for developing the recording material by heating (heating plate 4), and a fixing section (located at the conveying belt 2c) positioned downstream of the developing section for irradiating the recording material with visible light.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a light source emitting a visible light in the fixing unit of Mouri et al. as taught by Umehara et al. since any light source is

acceptable in the device of Mouri et al. The motivation for doing so would have been to provide an inexpensive and easy to use light source as a fixing unit.

Mouri et al. further teaches the image exposure unit provided with a light source that includes laser, LEDs, fluorescent lamp, whose wavelength would range anywhere from 300 to 1100 nm (claims 2, 13), the recording material having compositions with sensitivity at 300 to 370 nm (claim 12), the heating developing portion developing the recording material with a heating temperature of 120° C (claim 4), and the image recording relates only to processing of a single sheet (claim 21) (the recording material being cut into single sheets by the cutter 16) (see also col. 3, lines 49-52).

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mouri et al. in view of Umehara et al., as applied to claim 1 above, and further in view of Uji-le et al. (U.S. 4,332,884).

Mouri et al., as modified by Umehara et al., discloses all the basic limitations of the claimed invention except for the maximum irradiation energy of the recording light being set between 0.01 to 50 mJ/cm².

Regardless, Uji-le et al. discloses the use of an ultra-violet light for recording and a visible light for fixing an image formed on a light and heat sensitive recording medium, the maximum irradiation energy of the recording light being set at 0.15 mJ/cm² (see Examples 16 to 20 on column 24).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Mouri et al., as modified by

Yamamoto, with the aforementioned teachings of Uji-ie et al. for the purpose of generating the high-contrast image.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mouri et al. in view of Umehara et al., as applied to claim 1 above, and further in view of Yamada.

Mouri et al., as modified by Umehara et al., discloses all the basic limitations of the claimed invention except for the range of variation of the heating temperature of the thermal developing section being set at most 5° C.

Regardless, it is known in the printing art that the temperature distribution in a heat-developing device should be kept less than $\pm 1^{\circ}\text{C}$ as a requirement. Yamada et al., for example, discloses a heat-developable image recording material whose temperature distribution variation would be kept within a strict requirement of $\pm 1^{\circ}\text{C}$ during the heat development of the color latent image (see Table 1).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Mouri et al. with the temperature distribution variation limitation as taught by Yamada et al. for the purpose of providing a sharp color image.

12. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mouri et al. in view of Umehara et al., as applied to claim 1 above, and further in view of Kubo et al.

Mouri et al. in view of Umehara et al. discloses all the basic limitations of the claimed invention except for the composition of the light and heat sensitive recording layer.

However, Kubo et al. discloses a method of recording an image on a heat and light-sensitive recording material, which includes providing visible light of three waves having different wavelengths for imagewise exposing the heat and light-sensitive recording material to form a latent image, heat developing the latent image, and an UV light to fix the developed image (col. 3, lines 36-59), the recording process being performed in the above specified sequences. Kubo et al. further teaches the recording light having an intensity maximum at wavelength selected from a wavelength range of 300 and 1100 nm (RGB light), the thermal developing temperature being of 50 to 200°C (col. 3, lines 60-64). Kubo et al. also discloses the heat and light-sensitive recording material having layer comprising color-forming component or dye-precursor being either enclosed in the core of the microcapsules or disposed in the shell of the microcapsules and a photo-polymerization composition or developer being again disposed outside of the microcapsules or enclosed in the microcapsules such that they are capable of reacting to each other to form color, the photo-polymerization composition further containing a photo-polymerization initiator (5) and a polymerizing substance (6). With regard to claims 10, 11, Kubo et al. teaches the heat and light-sensitive recording material being provided with a photo-curable heat and light-sensitive recording layer having a dye-forming coupler such as phenolic compounds capable of coupling with the

oxidant (diazonium salts) to form a dye, such that light irradiation cures an irradiated portion of the heat and light-sensitive recording layer.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Mouri et al. with the aforementioned teachings of Kubo et al. for the purpose of accelerating the development reaction of the recording material compounds under the exposure of proper light.

13. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mouri et al. in view of Umehara et al., as applied to claim 12 above, and further in view of Okino (U.S. 4,958,233).

Mouri et al., as modified by Umehara et al., discloses all the basic limitations of the claimed invention except for the type of laser sources.

Okino, an acknowledged prior art, discloses an image recording apparatus comprising a casing section (photosensitive material magazine 14), which encases a light and heat sensitive recording material (light-sensitive and heat-developable material S), an optical recording section (digital exposure unit 200), downstream of the casing section (see Fig. 1), which exposes the light and heat sensitive recording material to visible light (RGB lights), which has been fed from the casing section, for recording a latent image, a thermal developing section (thermal developing unit 40), downstream of the optical recording section, which develops the latent image by heating (using curved heating board 43), and an optical fixing section (image fixing unit 106), downstream of

the thermal developing section, which irradiates UV light for fixing the developed image. Okino further teaches the light source being a semiconductor laser, and using different light sources of different wavelengths, all of semiconductor lasers.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Mouri et al. with the aforementioned teachings of Okino. The motivation for doing so would have been to provide a sharp coherent light sources to expose the light and heat sensitive recording material.

Response to Arguments

14. Applicant's arguments filed 10/14/03 have been fully considered but they are not persuasive.

15. Applicants argue that it is "unclear how the fixing process is achieved" in Umehara and that "[T]he second sequence would appear to lack a sequential downstream process of visible light exposure, heating, and visible light fixing since the last two steps are combined". However, Umehara clearly discloses three distinct sections in the image recording device, which includes an optical recording section located at the web section (2a) followed by a heat developing section provided with a heating plate (4) and located at the web section (2b), and further downstream a separate optical fixing section provided with a light source (5) emitting a visible light beam along with another heating plate (4) located at the web side (2c) such that the fixing and heating are simultaneously performed.

Applicants further argue with regard to Yamamoto and Umehara that "[S]ince the references relate to fundamentally different types of processing, their combination is not proper"; the examiner respectfully points out that the combination of the above references consists of the incorporation the casing section which encases a light and heat sensitive recording material as taught by Yamamoto and that such combination would not require to modify the entire process of the main reference with a different type of processing. The inclusion of the above casing is elementary and would require only routine skill in the art.

Applicants further argue with regard to Yamamoto and Umehara that the motivation to combine is also improper. However, since the light and heat sensitive recording material is used in both references, such casing would be necessary and advantageous so as to shield the [inherently] light-sensitive material from light since the exposure section is located so closed to the original location of the light-sensitive material.

Nevertheless, the newly cited prior art, Mouri et al. teaches an image forming apparatus that would be more in line with the configuration of the device as taught by Umehara et al. since the light source of the exposure portion of Mouri et al. includes a variety of light sources, which expands to those emitting visible light (exposure using fluorescent lamp).

With regard to Applicants' arguments related to Okino, Kubo, and Uji-ie, which "specifically relate to recording materials fixed by UV light", "[I]t would not be obvious to vary the disclosed compositions, which are sensitive to different wavelengths, to arrive

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at the claimed invention", the examiner respectfully points out that Umehara teaches the light and heat sensitive recording material being fixed by either a UV light (first recording sequence) or a visible light (second recording sequence), making the disclosed compositions in both references compatible. Moreover, Mouri et al., the newly cited prior art, teaches the recording material including compositions having sensitivity to UV light and being compatibly exposed to a variety of light sources, whose wavelength range expand to visible light (exposure using fluorescent lamp).

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



HAI PHAM
PRIMARY EXAMINER

December 17, 2003